

Remarks/Arguments

Objections to the Claims

The Examiner objected to an informality in the preamble of Claim 1. Applicant has amended Claim 1 to correct the informality and courteously requests that the objection be removed.

Rejection of Claims 1-19 under 35 U.S.C. §103(a)

The Examiner rejected Claims 1-19 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,271,369 (Melendrez) in view of U.S. Patent No. 5,063,368 (Ettehadieh). Applicant respectfully traverses the rejection.

“There are three requirements to establish a *prima facie* case of obviousness: there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; there must be a reasonable expectation of success; and, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant’s disclosure.” *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1483 (Fed. Cir. 1991).”

Claim 1

Claim 1 recites: “at least one magnet having a lower side, said magnet longitudinally disposed adjacent a fuel line; and operatively arranged to focus a magnetic field toward said fuel line; at least one ferrous metal plate disposed on an upper side of said magnet”

Ettehadieh is inoperable

There is an overarching problem with the arrangement of magnets 14 in Figures 7 and 8 of Ettehadieh and magnets 114 in Figure 6 of Ettehadieh: like polarities are shown in direct

contact with each other, which is completely contrary to well-established practice in the field of magnets and magnetism. In the reply of May 19, 2006, Applicant provided as Appendix A, a sketch of magnets 14 in Figures 7 and 8 of Ettehadieh. A similar sketch of magnets 14 in Figures 7 and 8 of Ettehadieh has been attached to this paper as Appendix A. As was shown in the May 19 reply, it is well known that like magnetic poles repel each other, as shown on page 3 of Appendix B (an excerpt from www.school-for-champions.com). Therefore, there will be a relatively large force pushing the magnets apart. Hence, the composite structure of Ettehadieh is completely unstable and cannot maintain the configuration shown in Figures 6, 7 and 8 without the application of large outside forces and restraining mechanisms. In fact, Applicant contends that there is no practical method available for restraining the repulsing force exerted by the like poles of the four magnets in Ettehadieh that would be sufficient to hold the four magnets in the arrangement shown in Ettehadieh.

In the Response to Arguments, the Examiner stated: "Applicant attacks the viability of the Ettehadieh reference claiming that the magnets are configured such that like polarities are in direct contact with each other. This is not true, as shown by Figure 6-8 and column 3, lines 48-52, which cite that the "magnets 14 are arranged within the housing 12 in a stacked configuration of two *adjacent columns*, with two magnets in each column and the south poles of each magnet facing the bottom side wall 24 of housing 12 and fuel line 28 and the north poles facing towards the top wall 22 of the housing, as seen in FIG.7" (emphasis added).

The Examiner has failed to appreciate that there are two columns of magnets shown in Figure 7 and that the cited text from Ettehadieh does not address the effects of the magnets that are side-by-side in Figure 7. As shown in Appendix A, magnets 14A and 14C form one column and magnets 14B and 14D form the other column as shown in Figure 7. As the Examiner has correctly pointed out, magnets 14A and 14C and 14B and 14D are configured with opposite poles in contact. For example, the south pole of magnet 14A is facing the north pole of magnet 14C. **However, like poles for magnets 14A and 14B and like poles for magnets 14C and 14D are shown in direct contact in Figure 7.** For example, the north and south poles of magnet 14A and are shown in direct contact with the respective north and south poles of magnet 14B.

In Figures 6, 7 and 8, Ettehadieh does not show the restraining mechanism that would be necessary to hold the magnets in contact and overcome the forces of repulsion that would push the magnets apart as described *supra*. In fact, it is virtually impossible to hold like poles of magnets in direct contact as taught by Ettehadieh. In other words, the respective arrangements shown Figures 6, 7 and 8 are inoperable.

Figures 6-8 of Ettehadieh show magnets **14** and **114** creating a field akin to the field shown on page 2 of Appendix B and the manipulation of this field is the basis of his invention. However magnets **14** and **114** would not form the organized fields shown by Ettehadieh due to the repulsion of like poles for the side-by-side magnets. Page 3 of Appendix B shows field lines for one pair of magnets, having only one set of poles in opposition (north in this case). Even with only one pair of poles in opposition on page 3, the field lines on pages 1 and 3 are completely dissimilar. Applicant asserts that the actual magnetic flux lines that would result from the configuration shown in Figures 6, 7 and 8 of Ettehadieh would be entirely different than that shown in those figures since the repulsion of like poles would not allow the configuration depicted in the figures. Opposing both poles of both magnets shown on page 3 and then adding a second pair of similarly configured magnets, as is the case for magnets **14** and **114**, would only exacerbate the difference.

“When the reference relied on expressly anticipates or makes obvious all of the elements of the claimed invention, the reference is presumed to be operable. Once such a reference is found, the burden is on applicant to provide facts rebutting the presumption of operability.” *In re Sasse*, 629 F.2d 675, 207 USPQ 107 (CCPA 1980).

Applicant has clearly demonstrated that the arrangement of Ettehadieh is not operable.
Ettehadieh is contrary to sound scientific principle

As shown *supra*, Ettehadieh's configuration for magnets **14** and **114** flies in the face of sound scientific principle. That is, it is contrary to sound principles in the field of magnetism to attempt to form a plurality of separate magnets into a configuration in which like poles are touching. Further, the alleged flux lines shown in Figures 6, 7, and 8 cannot be formed by the arrangement shown in Figures 6-8 and have no basis in scientific principle.

“The rationale to support a rejection under 35 U.S.C. 103 may rely on logic and sound scientific principle.” *In re Soli*, 317 F.2d 941, 137 USPQ 797 (CCPA 1963).

Applicant has clearly demonstrated that the arrangement of Ettehadieh is illogical and contrary to sound scientific principles regarding magnetism.

Ettehadieh is non-analogous

Assuming *arguendo* that Ettehadieh did teach the force and structure to hold the mutually repulsing magnets shown in Figures 6-8, which Ettehadieh does not, this arrangement of four mutually repulsing magnets, initially pushed together by outside force, and maintained in an inherently unstable configuration by additional restraining means is clearly not analogous to the structure recited in Claim 1 and supported by the specification of the instant application. In particular, the flux lines produced by the arrangements in Figures 6-8 of Ettehadieh would be nothing like the flux lines produced by Melendrez or the arrangement recited in Claim 1.

There is no motivation to combine the cited references and no reasonable expectation of success

Elements of separate patents cannot be combined when there is no suggestion of such combination. *See Panduit Corp. v. Dennison Manufacturing Co.*, 1 U.S.P.Q.2d 1593 (Fed. Cir. 1987). The recognized law for combining references to support the conclusion that the claimed combination of structural features is directed to obvious subject matter requires that either the references expressly or impliedly teach or suggest the claimed combination, or the Examiner must present a convincing line of reasoning as to why an artisan would have found the claimed invention to have been obvious in light of the teachings of the references. *See e.g., Ex parte Clapp*, 227 USPQ 972 (973) (PTO Br Pat. App. & Int. 1985); *In re Geiger*, 2 USPQ2d 1276 (CA, Fed. Cir. 1987).

Appellants respectfully submit that the Examiner has provided no rational basis for combining Ettehadieh with Melendrez. In other words, why would a person skilled in the art make such a combination? Ettehadieh teaches a completely different arrangement of magnets than Melendrez, as is amply shown above. Applicant also has shown, as would be clear to a person skilled in the art, that the actual magnetic flux lines produced by the arrangement in

Figures 6-8 in Ettehadieh would be nothing like the purported lines shown in Figure 6-8 or that would be produced by the arrangements taught by Melendrez and recited in Claim 1.

Ettehadieh teaches that the magnetic fields produced by the arrangements in Figures 6-8 interact with fuel in a fuel line to improve the efficiency of an engine burning the fuel. Meledrez also teaches arrangements of magnets to modify fuel for more efficient burning. However, since the fields produced by Melendrez and Ettehadieh are so utterly unlike, there can be no presumption that the fields produced by Meledrez and Ettehadieh would produce anywhere near the same effect on the respective fuels. In fact, it is obvious that the fields produced by Meledrez and Ettehadieh must produce different effects on the respective fuels.

Therefore, assuming *arguendo* that Ettehadieh produces a beneficial effect on the fuel, and Ettehadieh has provided no support for the alleged improvements, there can be no expectation that moving the plate from Ettehadieh to the completely different arrangement taught by Melendrez would have the same effects, a positive effect, or any effect at all on the fuel conditioned by the arrangement of Melendrez.

Alternately stated, Ettehadieh teaches that plates **16** and **116** modify the magnetic fields produced by the arrangement shown in Figures 6 and 8, respectively. The fields produced by the arrangement in Figures 6 and 8 and the arrangement taught by Melendrez are very different as shown *supra*. There is no evidence that the respective plates from Figures 6 or 8 of Ettehadieh would positively modify the fields produced by Melendrez's arrangements.

In fact, there is no reason to suppose that modifying Melendrez per Figures 6 or 8 of Ettehadieh would have any positive effect. Ettehadieh gives no teaching, suggestion, or motivation regarding use of a plate with the completely different arrangement of magnets taught by Melendrez. Further, the Examiner has failed to provide any evidence or teaching to show that a plate used with the configurations taught by Ettehadieh could be expected to provide enhanced performance for the different arrangement of magnets taught by Melendrez. Given the utter difference in the magnetic fields associated with Ettehadieh and Melendrez, it would be just as likely to assume that the plate would worsen the performance of Melendrez's arrangements.

In summary, there is no motivation to make the combination suggested by the Examiner and even if made, there would be no reasonable expectation of success.

The Examiner has applied impermissible hindsight

“The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure.” *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Applicant courteously submits that the Examiner has applied impermissible hindsight reconstruction by rendering the invention obvious after having the benefit of a prior reading of Applicant's own disclosure. *See In re McLaughlin*, 443 F.2d 1392, 1395, 170 USPQ 209, 212 (CCPA 1971). Consequently, Applicant argues that no convincing line of reasoning is provided as a basis for modifying and combining Melendrez and Ettehadieh independent of Applicant's own disclosure. Thus, the modification of Melendrez appears to be based on hindsight from a prior reading of Applicant's own disclosure and therefore cannot support a *prima facie* case of obviousness.

Ettehadieh teaches against using a plate on Melendrez's arrangement

Every figure in Ettehadieh and every description in the specification of Ettehadieh is solely directed to the stacked, side-by-side arrangement of magnets shown, for example, in Figures 6-8 of Ettehadieh. That is, Ettehadieh only teaches that the use of a plate is beneficial with the stacked, side-by-side arrangement, not with the arrangement shown in Melendrez or recited in Claim 1. “A *prima facie* case of obviousness can be rebutted if one of the cited references teaches away from the claimed invention. *See In re Geisler*, 43 U.S.P.Q. 2d 1362, 1366 (Fed. Cir. 1997).”

For all the reasons stated above, Claim 1 is patentable over Melendrez in view of Ettehadieh. Claims 2-13, 18 and 19, dependent from Claim 1, enjoy the same distinction with respect to the cited references.

Claim 14

Amended Claim 14 recites: “a first magnet having a lower side centrally disposed adjacent longitudinal portion of the fuel line to provide a magnetic field proximate said fuel line; a second magnet disposed on top of said first magnet in magnetic attraction therewith at least one

Attorney Docket No.: ZIGP:102US
U.S. Patent Application No.: 10/605,623
Reply to Office Action of August 11, 2006
Date: April 11, 2007

ferrous metal plate disposed near an upper side of the second magnet” The Examiner applied the same rationale to Claims 1 and 14.

Applicant has shown that Claim 1 is patentable over Melendrez in view of Ettehadieh. Therefore, Claim 14 also is patentable over Melendrez in view of Ettehadieh. Claims 15-17, dependent from Claim 14, enjoy the same distinction with respect to the cited references.

Applicant courteously requests that the rejection be removed.

Conclusion

Applicant respectfully submits that all pending claims are now in condition for allowance, which action is courteously requested.

Respectfully submitted,

/C. Paul Maliszewski/

C. Paul Maliszewski
Registration No. 51,990
Simpson & Simpson, PLLC
5555 Main Street
Williamsville, NY 14221-5406
Telephone No. 716-626-1564

CPM/

Dated: April 11, 2007

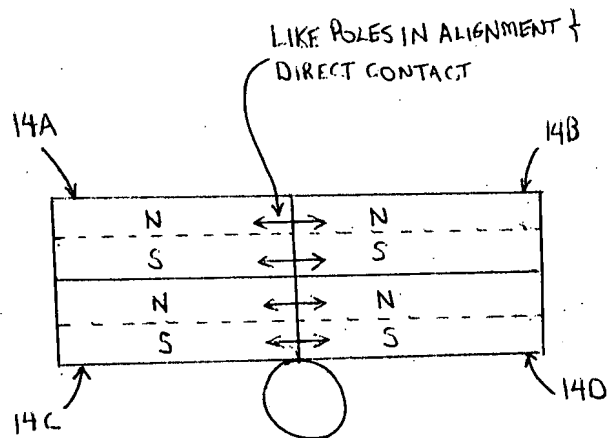
Attorney Docket No.: ZIGP:102US
U.S. Patent Application No.:10/605,623
Reply to Office Action of August 11, 2006
Date: April 11, 2007

Appendix



Attorney Docket No.: ZIGP:102US
U.S. Patent Application No.: 10/605,623
Reply to Office Action of August 11, 2006
Date: April 11, 2007

Appendix A





Attorney Docket No.: ZIGP:102US
U.S. Patent Application No.: 10/605,623
Reply to Office Action of August 11, 2006
Date: April 11, 2007

Appendix B Page 1 of 3

School for Champions | Physical Science | Experiments | Senses | Good Grades
| List Your School!
Explanation of magnetism to succeed in Physical Science. Also refer to physics, force, distance, magnetic field, electric charge, electron, magnet, ferromagnetism, iron, cobalt, nickel, Lorentz, attraction, repulsion, Ron Kurtus, School for Champions.
Copyright Restrictions

Magnetism

by Ron Kurtus (revised 24 November 2004)

Magnetism is a force that acts at a distance and is caused by a magnetic field. This force strongly attracts ferromagnetic materials such as iron, nickel and cobalt. In magnets, the magnetic force strongly attracts an opposite pole of another magnet and repels a like pole. The magnetic field is both similar and different than an electric field.

Questions you may have include:

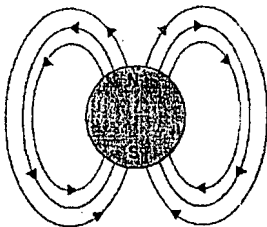
- What is a magnetic field?
- What is a magnetic force?
- How do magnetic and electric fields compare?

This lesson will answer those questions. There is a mini-quiz near the end of this lesson.

Magnetic field

A magnetic field consists of imaginary lines of flux coming from moving or spinning electrically charged particles. Examples include the spin of a proton and the motion of electrons through a wire in an electric circuit.

What a magnetic field actually consists of is somewhat of a mystery, but we do know it is a special property of space.



Magnetic field or lines of flux of a moving charged particle

Names of poles

Magnets

Although individual particles such as electrons can have magnetic fields, larger objects such as a piece of iron can also have a magnetic field, as a sum of the fields of its particles. If a larger object exhibits a sufficiently great magnetic field, it is called a magnet.

(See Magnets for more information.)

Magnetic force

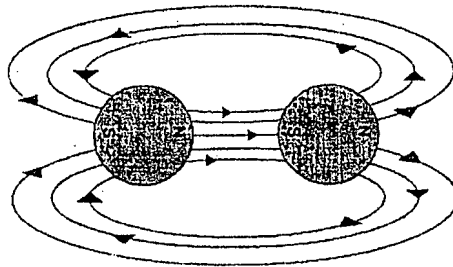
The magnetic field of an object can create a magnetic force on other objects with magnetic fields. That force is what we call magnetism.

When a magnetic field is applied to a moving electric charge, such as a moving proton or the electrical current in a wire, the force on the charge is called a Lorentz force.

(See Magnetism and the Lorentz Force for more information.)

Attraction

When two magnets or magnetic objects are close to each other, there is a force that attracts the poles together.



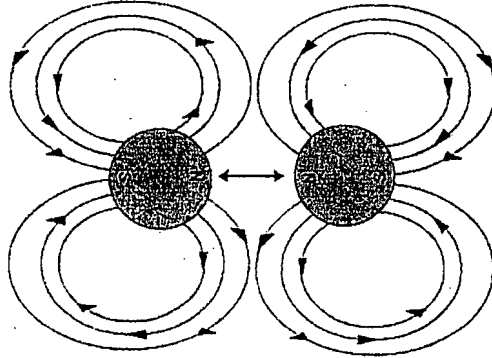
Force attracts N to S

Magnets also strongly attract ferromagnetic materials such as iron, nickel and cobalt.

(See Magnetic Materials for more information.)

Repulsion

When two magnetic objects have like poles facing each other, the magnetic force pushes them apart.



Force pushes magnetic objects apart

Magnets can also weakly repel diamagnetic materials. (See [*Magnetic Materials*](#) for more information.)

Magnetic and electric fields

The magnetic and electric fields are both similar and different. They are also inter-related.

Electric charges and magnetism similar

Just as the positive (+) and negative (-) electrical charges attract each other, the N and S poles of a magnet attract each other.

In electricity like charges repel, and in magnetism like poles repel.

Electric charges and magnetism different

The magnetic field is a dipole field. That means that every magnet must have two poles.

On the other hand, a positive (+) or negative (-) electrical charge can stand alone. Electrical charges are called monopoles, since they can exist without the opposite charge.